



Average Marginal Tax Rates from Social Security and the Individual Income Tax

Citation

Barro, Robert J., and Chaipat Sahasakul. 1986. Average marginal tax rates from social security and the individual income tax. *Journal of Business* 59(4): 555-566.

Published Version

doi:10.1086/296354

Permanent link

<http://nrs.harvard.edu/urn-3:HUL.InstRepos:3451298>

Terms of Use

This article was downloaded from Harvard University's DASH repository, and is made available under the terms and conditions applicable to Other Posted Material, as set forth at <http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA>

Share Your Story

The Harvard community has made this article openly available.
Please share how this access benefits you. [Submit a story](#).

[Accessibility](#)

Robert J. Barro

University of Rochester

Chaipat Sahasakul

Rutgers University

Average Marginal Tax Rates from Social Security and the Individual Income Tax*

In our previous paper (Barro and Sahasakul 1983) we provided estimates of average marginal tax rates from the federal individual income tax for 1916–80. Now we extend these figures to 1983 and supplement them to include the social security tax on labor earnings. With this addition, in 1983 the included taxes constitute 73% of federal and 45% of total government receipts. If some nontax items are excluded, the values are 78% and 53%, respectively.¹

In the main, the social security levy is a flat-rate tax, paid partly by workers, partly by employers, and partly by self-employed persons. The computation of average marginal tax rates is simpler than in the case of the federal income tax, which has a graduated-rate structure and allows for numerous deductions from taxable income. The main complications that arise for the social security tax are the following. (a) For workers and self-employed persons with earnings above a ceiling value the marginal tax rate is nil; (b) the tax applies only to labor earnings (and to earnings from self-employment) rather than to total income; (c) the employer and employee

We extend previous estimates of the average marginal tax rate from the federal individual income tax to include social security. Our computations consider the tax rates on employers, employees, and the self-employed; the income that accrues to persons with earnings below the ceiling; and the effective deductibility of employers' social security contributions from workers' taxable income. The net effect of social security on the average marginal tax rate is below .02 until 1966 but then rises to .03 in 1968, .04 in 1973, .05 in 1974, .06 in 1979, and .07 in 1982.

* This research was supported by the National Science Foundation. We appreciate the data that were provided on income taxes by Dan Holik and on social security by Anthony Pellechio and Wayne Long.

1. The data are from *U.S. Survey of Current Business*, March 1986.

(*Journal of Business*, 1986, vol. 59, no. 4, pt. 1)

© 1986 by The University of Chicago. All rights reserved.
0021-9398/86/5904-0002\$01.50

parts of the tax differ because the employer's payments are not counted as part of the employee's taxable income; and (d) an individual's future social security benefits depend positively on that person's history of contributions. The last element reduces the effective tax rate that an individual faces. In fact, Gordon (1982) argues that this consideration is important for people who are close to retirement age. Generally, the inclusion of this effect would require forecasts of benefit schedules as well as survival probabilities. It would also be necessary to include various complexities of the social security law, such as the declining marginal effect of past covered earnings on benefits, the exclusion of some years of earnings from the formula, and the treatment of spouses and dependents. In any event, our subsequent calculations do not take account of the effects of social security contributions on future benefits. Thus, by including only the tax aspects of these "contributions," we somewhat overstate the effective marginal tax rates from the social security program.

I. Theoretical Considerations

Let s_f be the social security tax rate (marginal and average) paid by a firm on workers' earnings. If profits are taxed at the rate τ_π , then the firm's after-tax profits are

$$\pi = (1 - \tau_\pi) [F(L) - wL(1 + s_f)], \quad (1)$$

where L is the quantity of labor input, w is the real wage rate, and $F(L)$ is the production function. Maximization of profit implies

$$F' = w(1 + s_f), \quad (2)$$

where F' is labor's marginal product.

The representative worker's total real income, Y , equals $wL + I$, where I is nonlabor income. As in our previous paper, this income is spent on consumption, C , or on income taxes, T .² In addition, there is now the worker's social security tax, $s_e \cdot wL$, where s_e is the employee's (marginal and average) contribution rate. Thus we have

$$Y = wL + I = C + T + s_e(wL). \quad (3)$$

As before, income taxes, T , depend on taxable income, $Y - D$, where D is a broad concept of deductions. If utility depends positively on consumption and negatively on work, then the first-order condition for

2. For present purposes it is unnecessary for us to consider two categories of consumption—depending on the treatment by the tax law—as we did in the earlier paper. We also do not allow here for efforts aimed at avoiding income taxes.

maximizing utility can be written as

$$\frac{-\partial U/\partial L}{\partial U/\partial C} = w(1 - T' - s_e), \quad (4)$$

where T' is the marginal income-tax rate.

Substituting for w from equation (2) into equation (4) implies

$$\frac{-\partial U/\partial L}{\partial U/\partial C} = \frac{F'(1 - T' - s_e)}{1 + s_f}. \quad (5)$$

Thus equation (5) shows how the tax system creates a positive wedge between labor's marginal product, F' , and the utility rate of substitution between consumption and leisure, $-(\partial U/\partial L)/(\partial U/\partial C)$.

Let τ be the overall effective marginal tax rate on labor's marginal product, F' . Then equation (5) implies

$$1 - \tau = \frac{1 - T' - s_e}{1 + s_f},$$

or

$$\tau = \frac{1}{1 + s_f} (s_f + s_e + T'). \quad (6)$$

Thus the tax system effectively deflates labor's marginal product, F' , by the factor $1 + s_f$ (see eq. [2]) and then applies the marginal tax rate, $s_f + s_e + T'$.³ If the social security tax is not purely a flat-rate levy (because of the ceiling on taxable earnings in the U.S. system), then we can interpret s_f and s_e in equation (6) as the marginal social security tax rates.

For self-employed persons the formula is simpler; namely, if s_s is the marginal contribution rate to social security, then the effective marginal tax rate, τ_s , is⁴

$$\tau_s = s_s + T'. \quad (7)$$

Previously, we calculated weighted averages, \bar{T}' , of the marginal income tax rates, T' . We weighted either by adjusted gross income or by numbers of returns, and we computed arithmetic and geometric averages. Here we consider only the series that we focused on earlier, which is the arithmetic average weighted by adjusted gross income.

3. Note that τ does not depend solely on the sum $s_f + s_e$. That is because, unlike the worker's payments, the employer's payments are not part of the worker's tax base.

4. If the marginal tax rates, T' , are equal, then the equation of τ_s from (7) to τ in (6) requires s_s to be less than $s_f + s_e$, as was true in the United States until 1984. For example, if $T' = .3$ and $s_f = s_e = .067$ (the value for 1982), then the equalizing value for s_s is .017. The actual value of s_s for 1982 was .0935. The social security law passed in 1983 and effective in 1984 sets the self-employed rate equal to the sum $s_f + s_e$ but provides for some offsetting income tax credits.

Equations (6)–(7) tell us the necessary extensions to go from the previous measures, \bar{T}' , to weighted averages, $\bar{\tau}$, that include the social security tax; namely,⁵

$$\bar{\tau} \approx \bar{T}' + \Omega_1 \left(\frac{s_f + s_e}{1 + s_f} \right) + \Omega_2 \cdot s_s - \Omega_1 \cdot s_f \cdot \bar{T}'', \quad (8)$$

where s_f , s_e , and s_s are now the social security contribution rates for persons with earnings below the taxable ceiling;⁶ Ω_1 is the ratio to aggregate adjusted gross income of the wage and salary income of workers with earnings below the ceiling; Ω_2 is the corresponding ratio for self-employed persons; and \bar{T}'' is the (weighted) average marginal tax rate for workers with earnings below the ceiling.

II. Computations of Tax Rates

Table 1 shows the salaries and wages (col. 1) and self-employment income (col. 3) that accrue in each year to persons with earnings below the ceiling. (In col. 4 the table shows the dollar value of the ceiling for each year.) These data, combined with values of aggregate adjusted gross income, allow us to calculate the weights Ω_1 and Ω_2 , which appear in equation (8). These weights are in columns 5–6 of table 1.

For subsequent purposes the important variable is Ω_1 , the ratio to adjusted gross income of the salaries and wages of persons below the ceiling. This ratio can be divided into two parts—first, the ratio of salaries and wages of persons below the ceiling to the aggregate of salaries and wages (col. 2 of table 1) and, second, the ratio of aggregate salaries and wages to aggregate adjusted gross income. The latter ratio is highly stable about its mean value of .84. Hence Ω_1 fluctuates mainly because of changes in the fraction of overall salaries and wages that accrue to persons below the ceiling. This fraction depends in turn on the ceiling earnings for social security in relation to the distribution of nominal earnings in the economy. For example, the decrease in Ω_1 from .46 in 1937 to .24 in 1965 corresponds to a decline in the ratio of salaries and wages for persons below the ceiling to total salaries and wages from .57 to .29. This behavior reflects the relatively slow rise in the dollar ceiling on earnings, which increased from \$3,000 in 1937 to only \$4,800 in 1965. However, the ceiling has advanced rapidly since 1965, reaching \$35,700 in 1983. Correspondingly, the ratio of salaries and wages for persons below the ceiling to total salaries and wages went from .29 in 1965 to .68 in 1983. This change led to an increase in Ω_1 from .24 in 1965 to .57 in 1983.

5. To get the last term we approximate $T'/(1 + s_f) \approx T'(1 - s_f)$ in (6). This approximation is satisfactory for our data sample.

6. Note that the social security levy is a flat-rate tax in this range.

The values for $s_f = s_e$ and s_s for each year also appear in table 1. (These values are nonzero only since the start of the social security program in 1937.) Using these numbers we can calculate the second term, $\Omega_1(s_f + s_e)/1 + s_f$, and the third term, $\Omega_2 \cdot s_s$, on the right side of equation (8). The results appear in columns 2–3 of table 2.

It is more complicated to calculate the final term of equation (8), which depends on the average marginal tax rate \bar{T}'' for workers with earnings below the ceiling. From the IRS's *Statistics of Income, Individual Tax Returns* for each year, we approximated \bar{T}'' by using the marginal tax rates and associated values of adjusted gross income for the following filing units. First, we take all returns from income classes for which the average of salaries and wages per return is below the ceiling value. (For example, for 1980, when the ceiling on earnings is \$25,900, we go up to an adjusted gross income per return of \$30,000.) We then include enough additional joint returns from income classes where the average of salaries and wages per return is above the ceiling so as to exhaust the known total of salaries and wages that accrues to persons with earnings below the ceiling. However, we carry out this calculation by using the lowest possible income classes; that is, we assume that low numbers for individuals' salaries and wages correspond to low numbers for adjusted gross income per return. There is some approximation here since some of the low values for salaries and wages may come from either multi-earner families or families with high nonlabor income, which would have high marginal tax rates. But some experimentation indicates that the potential error is quantitatively unimportant. Column 4 of table 2 shows the resulting calculation for the final term, $-\Omega_1 s_f \bar{T}''$, in equation (8). Note that this term, which reflects the exclusion of firms' social security payments from workers' taxable income, is always below .01 in magnitude.

Our previous estimates of the average marginal tax rate when weighted by adjusted gross income, \bar{T}' , appear in column 1 of table 2. With the availability of more recent data we can now extend the series from 1980 to 1983. For 1981, where the Reagan tax cut applied only to a small extent, the effects of bracket creep actually raised the average marginal tax rate, \bar{T}' , from 30.4% in 1980 to 31.3% in 1981. But then there was a substantial drop to 29.3% in 1982 and 27.2% in 1983. The decline in the average marginal tax rate by 4.1 percentage points from 1981 to 1983 was much larger than that (2.6 percentage points) for the Kennedy-Johnson tax cut in 1964. When later data are available, it will be interesting to see the extent to which the average marginal tax rates declined further in 1983 and 1984.

The overall modifications to incorporate the social security tax—the sum of columns 2–4 in table 2—appear in column 5 of the table (labeled SS). Then the sum of columns 1 and 5 is the average marginal tax rate, $\bar{\tau}$, from the federal individual income tax and the social security tax.

TABLE 1 Social Security Variables

Years	Salaries and Wages below Ceiling (\$ billion) (1)	Column 1/ Total Salaries and Wages (2)	Self-employed Earnings below Ceiling (\$ billion) (3)	Ceiling (\$) (4)	Ω_1 (5)	Ω_2 (6)	$s_f = s_e$ (%) (7)	s_g (%) (8)
1937	26.5	.57	...	3,000	.46	...	1.0	0
1938	23.7	.55	...	3,000	.44	...	1.0	0
1939	26.6	.58	...	3,000	.47	...	1.0	0
1940	29.4	.59	...	3,000	.48	...	1.0	0
1941	36.3	.58	...	3,000	.48	...	1.0	0
1942	42.2	.51	...	3,000	.44	...	1.0	0
1943	44.6	.42	...	3,000	.38	...	1.0	0
1944	42.9	.37	...	3,000	.33	...	1.0	0
1945	43.9	.37	...	3,000	.33	...	1.0	0
1946	49.7	.44	...	3,000	.37	...	1.0	0
1947	49.5	.40	...	3,000	.33	...	1.0	0
1948	47.9	.35	...	3,000	.29	...	1.0	0
1949	46.6	.35	...	3,000	.29	...	1.0	0
1950	45.7	.31	...	3,000	.25	...	1.5	0
1951	65.1	.38	4.3	3,600	.32	.02	1.5	2.25
1952	64.6	.35	4.3	3,600	.30	.02	1.5	2.25
1953	63.2	.32	4.2	3,600	.27	.02	1.5	2.25
1954	61.4	.31	4.3	3,600	.27	.02	2.0	3.0
1955	79.1	.37	8.3	4,200	.32	.03	2.0	3.0
1956	81.2	.36	8.8	4,200	.30	.03	2.0	3.0
1957	84.5	.35	8.2	4,200	.30	.03	2.25	3.375
1958	82.9	.34	8.2	4,200	.29	.03	2.25	3.375
1959	101.4	.39	9.2	4,800	.33	.03	2.5	3.75

1960	100.5	.37	9.0	4,800	.32	.03	3.0	4.5
1961	98.5	.35	9.1	4,800	.30	.03	3.0	4.5
1962	99.3	.33	8.5	4,800	.28	.02	3.125	4.7
1963	99.6	.32	8.1	4,800	.27	.02	3.625	5.4
1964	100.5	.30	7.7	4,800	.25	.02	3.625	5.4
1965	103.7	.29	7.2	4,800	.24	.02	3.625	5.4
1966	166.4	.42	10.8	6,600	.35	.02	4.2	6.15
1967	168.4	.39	10.1	6,600	.33	.02	4.4	6.4
1968	214.6	.46	12.1	7,800	.39	.02	4.4	6.4
1969	214.6	.42	11.9	7,800	.35	.02	4.8	6.9
1970	215.5	.39	11.2	7,800	.34	.02	4.8	6.9
1971	209.9	.36	11.1	7,800	.31	.02	5.2	7.5
1972	253.9	.40	13.5	9,000	.34	.02	5.2	7.5
1973	326.9	.47	16.3	10,800	.39	.02	5.85	8.0
1974	414.9	.54	19.8	13,200	.46	.02	5.85	7.9
1975	430.6	.53	21.1	14,100	.45	.02	5.85	7.9
1976	477.0	.54	24.0	15,300	.45	.02	5.85	7.9
1977	528.9	.54	26.0	16,500	.45	.02	5.85	7.9
1978	591.1	.53	36.5	17,700	.45	.03	6.05	8.1
1979	778.8	.63	47.1	22,900	.53	.03	6.13	8.1
1980	878.8	.65	50.9	25,900	.54	.03	6.13	8.1
1981	999.3	.67	57.2	29,700	.56	.03	6.65	9.3
1982	1,067.2	.68	59.2	32,400	.57	.03	6.7	9.35
1983	1,136.8	.68	58.2	35,700	.57	.03	6.7	9.35

SOURCES.—U.S. Department of Health and Human Services, Social Security Administration, *Social Security Bulletin*, annual statistical supplement, various issues. Figures for cols. 1 and 3 for 1978–82 were provided by Anthony Pellechio; those for 1983 came from Wayne Long.

NOTE.—Column 1: total salaries and wages of persons whose salaries and wages fall below the ceiling; col. 2: col. 1/total salaries and wages. The denominator is from U.S. Department of Commerce, *National Income and Product Accounts of the U.S., 1929–1976*, and *U.S. Survey of Current Business*, July 1983, March 1986; col. 3: total earnings from self-employment for those whose earnings fall below the ceiling; col. 4: the ceiling on taxable salaries and wages or self-employment earnings for social security purposes; col. 5: Ω_1 = col. 1/total adjusted gross income; col. 6: Ω_2 = col. 3/total adjusted gross income; col. 7: s_f = s_e (social security tax rates on employers and employees); and col. 8: s_e (social security tax rate on self-employed persons).

TABLE 2 Average Marginal Tax Rates

Years	\bar{T}' (1)	$\Omega_1 \cdot \frac{s_f + s_e}{1 + s_f}$ (2)	$\Omega_2 \cdot s_s$ (3)	$-\Omega_1 \cdot s_f \cdot \bar{T}''$ (4)	SS (5)	$\bar{\tau}$ (6)
1916	.012	...	...	...	...	.012
1917	.037	...	...	...	...	.037
1918	.054	...	...	...	...	.054
1919	.052	...	...	...	...	.052
1920	.046	...	...	...	...	.046
1921	.042	...	...	...	...	.042
1922	.046	...	...	...	...	.046
1923	.033	...	...	...	...	.033
1924	.035	...	...	...	...	.035
1925	.030	...	...	...	...	.030
1926	.028	...	...	...	...	.028
1927	.032	...	...	...	...	.032
1928	.041	...	...	...	...	.041
1929	.035	...	...	...	...	.035
1930	.023	...	...	...	...	.023
1931	.017	...	...	...	...	.017
1932	.029	...	...	...	...	.029
1933	.031	...	...	...	...	.031
1934	.034	...	...	...	...	.034
1935	.038	...	...	...	...	.038
1936	.052	...	...	...	...	.052
1937	.046	.009	0	-.000	.009	.055
1938	.034	.009	0	-.000	.009	.043
1939	.038	.009	0	-.000	.009	.047
1940	.056	.010	0	-.000	.009	.065
1941	.113	.010	0	-.000	.009	.123
1942	.192	.009	0	-.001	.008	.200
1943	.209	.007	0	-.001	.007	.216
1944	.252	.007	0	-.001	.006	.258
1945	.257	.006	0	-.001	.006	.262
1946	.226	.007	0	-.000	.007	.233
1947	.226	.006	0	-.000	.006	.232
1948	.180	.006	0	-.000	.006	.185
1949	.175	.006	0	-.000	.005	.180
1950	.196	.008	0	-.000	.007	.202
1951	.231	.010	.000	-.001	.009	.240
1952	.251	.009	.000	-.001	.008	.259
1953	.249	.008	.000	-.001	.008	.257
1954	.222	.010	.001	-.001	.010	.231
1955	.228	.012	.001	-.001	.012	.240
1956	.232	.012	.001	-.001	.012	.243
1957	.232	.013	.001	-.001	.013	.245
1958	.229	.013	.001	-.001	.013	.242
1959	.236	.016	.001	-.001	.016	.252
1960	.234	.018	.001	-.002	.018	.253
1961	.240	.017	.001	-.002	.017	.257
1962	.244	.017	.001	-.002	.017	.260
1963	.247	.019	.001	-.002	.018	.265
1964	.221	.018	.001	-.001	.017	.238

TABLE 2 (Continued)

Years	\bar{T}' (1)	$\Omega_1 \cdot \frac{s_f + s_e}{1 + s_f}$ (2)	$\Omega_2 \cdot s_e$ (3)	$-\Omega_1 \cdot s_f \cdot \bar{T}''$ (4)	SS (5)	$\bar{\tau}$ (6)
1965	.212	.017	.001	-.001	.016	.229
1966	.217	.028	.001	-.002	.028	.245
1967	.223	.028	.001	-.002	.027	.250
1968	.252	.032	.001	-.003	.031	.283
1969	.261	.032	.001	-.003	.031	.292
1970	.243	.031	.001	-.003	.029	.272
1971	.239	.031	.001	-.003	.029	.268
1972	.242	.034	.001	-.003	.032	.274
1973	.250	.044	.002	-.004	.041	.291
1974	.257	.050	.002	-.004	.048	.305
1975	.263	.050	.002	-.005	.047	.310
1976	.273	.050	.002	-.005	.046	.319
1977	.281	.050	.002	-.005	.047	.328
1978	.310	.052	.002	-.006	.047	.357
1979	.289	.061	.003	-.007	.057	.346
1980	.304	.062	.002	-.008	.057	.362
1981	.313	.070	.003	-.010	.063	.376
1982	.293	.071	.003	-.008	.066	.359
1983	.272	.072	.003	-.008	.067	.339

NOTE.— \bar{T}' is the average marginal income tax rate, weighted by adjusted gross income, from Barro and Sahasakul (1983, table 2, col. 1). Values for 1981–82 are estimates based on Thompson and Hicks (1983) and Holik (1985); the value for 1983 is estimated from U.S. Internal Revenue Service (1985, table 3.4). Cols. 2–4: calculated with data from table 1; col. 5: SS = col. 2 + col. 3 + col. 4; col. 6: $\bar{\tau}$ = col. 1 + col. 5.

These values are in column 6 of the table. Figure 1 shows the average marginal tax rate from the individual income tax, \bar{T}' (col. 1 of table 2), the overall effect from social security, SS (col. 5), and the combined average marginal tax rate, $\bar{\tau}$ (col. 6).

Consider the overall effects from the inclusion of social security, as shown in column 5 of table 2 and in figure 1. The social security term, SS, is in the neighborhood of 1% from 1937 until 1958, reaches 2% in 1960, 3% in 1966, 4% in 1973, 5% in 1974, 6% in 1979, and almost 7% in 1982. Thus the inclusion of this term produces a combined average marginal tax rate, $\bar{\tau}$, that rises more steeply than does the income tax rate, \bar{T}' , especially since 1965. Instead of rising from 21% in 1965 to 31% in 1981 and 27% in 1983, we find that the $\bar{\tau}$ goes from 23% in 1965 to 38% in 1981 and 34% in 1983.

The overall effect from social security on the average marginal tax rate is always much less than the rate of employees below the ceiling, $(s_f + s_e)/(1 + s_f)$. Primarily, this difference arises because Ω_1 —the ratio of salaries and wages below the ceiling to aggregate adjusted gross income—is much less than unity. As mentioned before, the variations in Ω_1 derive mainly from changes in the ratio of salaries and wages below the ceiling to total salaries and wages, which appears in column

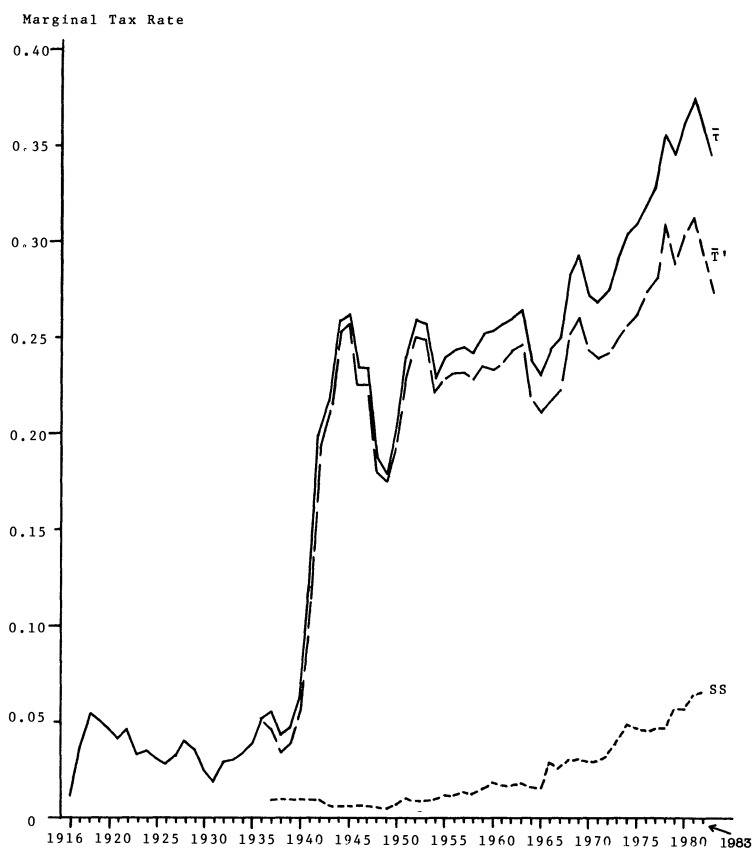


FIG. 1.—Average marginal tax rates

2 of table 1. For example, in 1965 only 29% of total salaries and wages accrued to persons below the ceiling. If there had been no ceiling (and, unrealistically, if the rate of tax, $s_f = s_e$, were unchanged), then the overall effect of SS would have increased by a factor of 3.5, from .016 to .056. On the other hand, the rapid increase of the ceiling in recent years has made this effect less important. In 1983, where 68% of total salaries and wages accrued to those below the ceiling, a removal of the ceiling (with contribution rates held fixed) would have raised the effect from SS by a factor of 1.5, from .067 to .100.

Table 3 compares the social security tax with the federal individual income tax for selected years. Notice that the ratio of revenues raised by social security to that from the income tax (shown in col. 5) rises from .07 in 1945 to .66 in 1983.

Column 6 of the table shows a crude measure of the relative "efficiencies" of the two types of taxes. This measure is the revenue

TABLE 3 A Comparison of the Social Security Tax with the Income Tax

Years	Social Security		Federal Individual Income Tax		Ratio of Revenues (Col. 1/Col. 3)	"Efficiency" Ratio (Col. 5 × Col. 4/Col. 2)
	Revenues (\$ billion) (1)	Contribution to Average Marginal Tax Rate (2)	Revenues (\$ billion) (3)	Contribution to Average Marginal Tax Rate (4)		
1940	.66	.009	1.01	.056	.65	4.1
1945	1.26	.006	18.5	.257	.07	2.9
1950	2.62	.007	17.4	.196	.15	4.2
1955	5.95	.012	30.4	.228	.20	3.7
1960	12.0	.019	41.8	.233	.29	3.5
1965	17.7	.017	51.1	.211	.35	4.3
1970	38.9	.031	88.8	.241	.44	3.4
1975	75.6	.049	120.8	.261	.63	3.3
1980	140.2	.061	250.9	.300	.56	2.7
1983	191.1	.071	288.6	.268	.66	2.5

SOURCES.—Columns 1 and 3 are from U.S. Commerce Department, *U.S. Survey of Current Business*, July 1983, March 1986, and *National Income & Product Accounts of the U.S., 1929-1976*.

NOTE.—Column 2 = $SS \text{ (col. 5 of table 2)} + (1/2)\Omega_1 \cdot s_f \cdot \bar{T}^*$ (col. 4 of table 2); col. 4 = \bar{T} (col. 1 of table 2) $- (1/2)\Omega_1 \cdot s_f \cdot \bar{T}^*$.

raised from social security divided by the contribution of this levy to the overall average marginal tax rate,⁷ expressed as a ratio to the corresponding figure for the income tax. On this basis the social security tax looks strikingly more efficient. Specifically, in 1983 the social security levy generates 2.5 times as much revenue per unit of average marginal tax rate as does the income tax, whereas in 1965 the corresponding number was 4.3. The main reason for the decline in this number since 1965 is the sharp rise in the ceiling on earnings, which has a positive effect on the average marginal tax rate from social security, relative to the revenue generated.

The social security levy turns out to be relatively "efficient" because it combines two features of a tax-rate schedule that have been stressed in the literature on optimal taxation. First, it is a flat-rate levy (on labor earnings and income from self-employment) in the range where the tax rate is positive. The shift to a flat-rate income tax has been proposed by, among others, Friedman (1962, ch. 10) and Hall and Rabushka (1983). (Surprisingly, these authors do not seem to mention that, in the social security tax, we already have a close approximation to the flat-rate income tax.) In comparison with a graduated-rate system, the flat-rate levy generates the same amount of revenues at a lower average marginal tax rate. Second, as advocated on theoretical grounds by Mirrlees (1971), the social security tax has a zero marginal rate at the top. However, as noted before, the rapid increase of the ceiling in recent years has made this feature less important than it used to be.

References

- Barro, R. J., and Sahasakul, C. 1983. Measuring the average marginal tax rate from the individual income tax. *Journal of Business* 56 (October): 419–52.
- Friedman, M. 1962. *Capitalism and Freedom*. Chicago: University of Chicago Press.
- Gordon, R. H. 1982. Social security and labor supply incentives. NBER Working Paper no. 986. Cambridge, Mass.: NBER, September.
- Hall, R. E., and Rabushka, A. 1983. *Low Tax, Simple Tax, Flat Tax*. New York: McGraw-Hill.
- Holik, D. 1985. Individual income tax rates, 1982. *Statistics of Income Bulletin* 4 (Spring): 1–11.
- Mirrlees, J. A. 1971. An exploration in the theory of optimum income taxation. *Review of Economic Studies* 38 (April): 175–208.
- Thompson, R., and Hicks, C. 1983. Average and marginal tax rates, 1981 individual income tax returns. *Statistics of Income Bulletin* 3 (Fall): 41–49.
- U.S. Internal Revenue Service. 1985. *Individual Income Tax Returns, 1983*. Washington, D.C.: U.S. Government Printing Office.

7. It is unclear how to allocate the cross-term, $-\Omega_1 \cdot s_f \cdot \bar{T}''$ (col. 4 of table 2), between the two levies, although this term is quantitatively unimportant. The figures shown in table 3 allocate half of this term to each type of tax.